Leighton and Associates

L&A

REPORT OF INVESTIGATION AND MITIGATION OF SOIL CONTAMINATION ENCOUNTERED DURING GRADING OPERATIONS AT NURSERY SUPPLIES, INC., CITY OF ORANGE, CALIFORNIA

REPORT OF INVESTIGATION AND MITIGATION OF SOIL CONTAMINATION ENCOUNTERED DURING GRADING OPERATIONS AT NURSERY SUPPLIES, INC., CITY OF ORANGE, CALIFORNIA

July 1, 1986

Project No. 2850974-05

Prepared For:

NURSERY SUPPLIES, INC.
534 West Struck Avenue
Orange, California 92667

ATTENTION: Mr. Ted Guarriello

LEIGHTON and ASSOCIATES
INCORPORATED

CELEBRATES 25 YEARS 1986

SOIL ENGINEERING GEOLOGY GEOPHYSICS GROUND WATER HAZARDOUS WASTES

July 1, 1986

Project No. 2850974-05

TO: Nursery Supplies, Inc.
534 West Struck Avenue
Orange, California 92667

ATTENTION: Mr. Ted Guarriello

SUBJECT: Report of Investigation and Mitigation of Soil Contamination Encountered During Grading Operations at Nursery Supplies, Inc., City of Orange, California

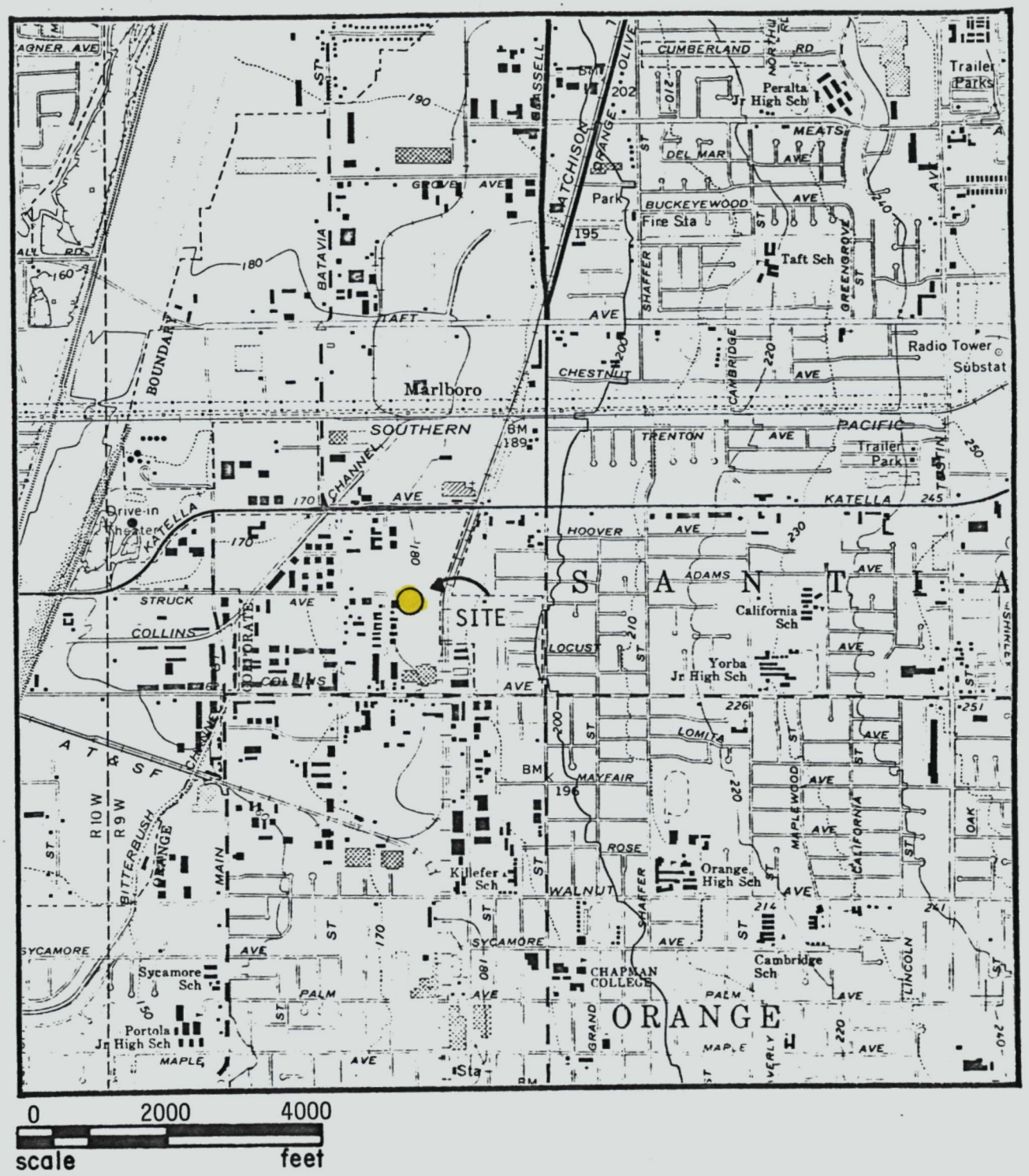
Introduction

In accordance with your authorization, Leighton and Associates, Inc. has conducted an investigation of soil contamination encountered during grading operations at the above-referenced site as well as assessment during mitigation. The purpose of our work was to evaluate the extent and nature of contamination, provide recommendations for mitigation and to observe and test for contamination during mitigation (removal of soil and aeration). The work was conducted during site grading activities related to concrete parking/storage/access road improvements.

This report presents the results of our investigation and mitigation of contaminated soil encountered during grading. Two additional areas adjacent to the graded area were identified as contaminated by styrene and ethyl benzene. These areas will require additional evaluation and mitigation and are discussed fully in the recommendations section of this report.

Accompanying Map, Illustrations and Appendices

INDEX MAP



INDEX MAP

OF

534 STRUCK AVENUE

CITY OF ORANGE, CALIFORNIA

(Subject Site Shown in Yellow)

BASE MAP: USGS Orange Quadrangle

LEIGHTON and ASSOCIATES
INCORPORATED

Site Description

The subject site is located directly south of the east end of Struck Avenue. An office building and manufacturing warehouse, surrounded by a paved parking lot is located on the northwest section of the property. On the east side of the property there is a railroad spur which runs the length of the site. The west side of the site (approximately 4.1 acres) is open land, a portion of which is used for storage of plastic plant containers.

The facility manufactures the plastic plant pots using styrene beads which are pressed in molds to form the end product. The styrene beads are shipped in by rail car. The facility does not handle any liquid chemicals.

Background

Nursery Supplies Inc. was conducting site improvements in September, 1985. The improvements included removal of existing asphaltic concrete (A/C) pavement along the easterly and southerly side of the facility and replacement with concrete paving. The undeveloped area south of the building and west of the loading dock was also to be covered with a concrete slab for use as a storage area (see Plate 1).

Following removal of the A/C pavement, conventional grading operations were being conducted to establish the subgrade elevations for placing concrete. Initial grading occurred in the roadway area east of the building (Area 1). Soils were removed to subgrade elevation and temporarily stockpiled adjacent to the loading dock.

On September 17, 1985, during routine soil testing for compaction purposes in the roadway area, possible soil contamination was found at subgrade levels.

Nursery Supplies, Inc. does not handle hazardous materials; however, the previous owner manufactured plastics and was contacted by Nursery Supplies Inc. in conference call with a representative of this office.

The previous owner reported that they used styrene monomer and ethyl benzene in the manufacturing process. These chemicals were brought in by rail tanker and pumped to underground tanks (Area 2 on Plate 1). There were no unloading operations or above ground storage of chemicals in the area of the roadway excavation (Area 1) where contamination was found.

Following a fire in 1982, the underground storage tanks were removed and the plant closed. The tank removal operation was approved by the City of Orange Fire Department.

Field Investigation

Area 1

On September 18 and 19, 1985, Leighton and Associates conducted a survey of Area 1 soils using a HNU Photoionization Detector (PID). The results of that survey

are shown on Plate 1. Two contaminated areas were identified (areas of T-1 and T-2 on Plate 1). The remainder of the area had background PID readings of 0 to 6 parts per million (ppm). The area of T-1 had a highest reading of 350 ppm and the area of T-2 had a highest reading of 60 ppm. A trench was excavated at each location to assess the vertical and lateral extent of contamination.

Trench 1 was excavated at the area of the 350 ppm reading (see Plate 1). Contaminated soil was excavated and stockpiled in Area 5 (see Plate 1). Contaminated soil extended to 6 feet in depth. The final dimensions of T-1 were approximately 9 feet wide by 35 feet long with a maximum depth of 8 feet and an average depth of 2 or 3 feet. Following removal of contaminated soil, a sample was taken from the bottom of the trench and analyzed for styrene and ethyl benzene. The sample tested as none detected, less than 0.1 ppm for both styrene and ethyl benzene (test results included as Appendix A, sample S-1-8').

Trench 2 was excavated at the area of the 60 ppm reading (see Plate 1). Contaminated soil was excavated and also stockpiled in Area 5 (see Plate 1). Contaminated soil extended to approximately 3 feet in depth. The dimension of the trench was approximately 5 feet wide by 25 feet long. Following removal of contaminated soil, a sample was taken from the bottom of the trench and analyzed for styrene and ethyl benzene. The sample tested as none detected, less than 0.1 ppm for both styrene and ethyl benzene (test results included as Appendix A, sample S-2 at 4').

Trenches 1 and 2 were excavated along the east edge of the area to be paved. Contaminated soil was noted in the east sidewall of each trench adjacent to the railroad spur. This soil was not removed so as to allow grading and construction of the roadway to continue. To prevent contamination from migrating laterally beneath the new pavement, both trenches were backfilled with a concrete slurry rather than compacted soil.

After excavation, sampling and testing of the trenches, Leighton and Associates met with Nursery Supplies Inc. and Mr. John Hills of the Health Care Agency for Orange County at the site on September 20, 1985. The above conditions were reviewed with the Health Care Agency and verbal approval for the work to date was received. It was also agreed that the soils which had been temporarily stockpiled adjacent to the loading dock during grading in the contaminated area would also be removed and stockpiled in Area 5.

Nursery Supplies, Inc. proposed to aerate the contaminated soil on site in Area 5 to reduce the level of contamination. Mr. John Hills indicated that authorization for that procedure was within the jurisdiction of the South Coast Air Quality Management District (AQMD). The necessary approval was obtained from AQMD (copy of letter included in Appendix A).

On September 23, 1985, a composite sample was collected from the stockpiled soils in Area 5 (from Trenches T-1 and T-2) and tested to provide an initial baseline for aeration. The test results were 29 ppm for styrene monomer and 12 ppm for ethyl benzene (a copy of the test results are included in Appendix A, sample Comp-1, Trench Stock Pile).

Area 2

Following the finding of contaminated soil in Area 1, Leighton and Associates provided observation and testing services during the remainder of the grading using the PID. On September 25, 1985, during grading operations to prepare the subgrade for concrete placement in the area of the former tank cavity, two small (approximately 2 feet in diameter) areas were found that exhibited readings of 30 ppm on the PID. Although this tank excavation had been approved by the City of Orange Fire Department, two trenches were excavated from 17 to 18.5 feet deep to below the bottom of the former tank cavity (trenches T-3 and T-4). Soil samples were collected at depths of 3, 6, 9, 12, 15, 17 feet in T-3 and T-4 as well as 18.5 feet in T-3. Each sample was checked with the PID; all samples registered 0 on the PID. From logging and observation of the trench wall it was clear that local loose debris and soil had been pushed locally onto the top of the tank cavity at the end of prior backfilling operations. This material was removed and added to the stockpiled soils in Area 5.

Area 3

Also on September 25, 1985, some contamination was noted by the loading dock. The area registered 85 ppm on the PID. Trench T-5 was excavated at this area. Trench T-5 was approximately 6 feet wide by 20 feet long and a maximum depth of 3 feet. The soil was stockpiled in Area 5.

A composite sample was collected from the bottom of the excavation and analyzed for styrene monomer and ethyl benzene. The test results were none detected, less than 0.1 ppm for both styrene monomer and ethyl benzene (lab results included in Appendix A, sample T-5 Comp. 1 at 3').

Area 4

On September 27, 1985, some contamination was noted in another area adjacent to the loading dock. Trench 6 was excavated at this area. Trench T-6 was approximately 10 feet wide by 24 feet long and a maximum depth of 3 feet. The soil was stockpiled in Area 5.

A composite sample was collected from the bottom of the excavation and analyzed for styrene monomer and ethyl benzene. The test results were none detected, less than 0.1 ppm for both styrene monomer and ethyl benzene (lab results included in Appendix A, sample T-6 Comp at 3').

No other contaminated soil was found during the grading operations at Nursery Supplies, Inc.

Aeration of Contaminated Soil

Following the stockpiling of contaminated soils in Area 5, the soils were spread in the large open space available in Area 5 to aerate and evaporate the styrene and ethyl benzene. The material was periodically turned to enhance the aeration process.

On November 15 and 18, 1985, composite soil samples were collected from the aerated soil. No contamination was detected with the PID. Composite samples were also collected from the underlying natural soil. Locations of composite samples are shown on Plate 2. Test results for all composite samples were none detected, less than 0.2 ppm for styrene and none detected, less than 0.1 ppm for ethyl benzene.

Soil and Ground Water

Soils at the site are alluvial deposits consisting of mixtures of silts, sands, gravels and cobbles. No ground water was encountered. Ground water information was obtained from the Orange County Flood Control Department and indicates that the water table is approximately 70 feet below the ground surface in this area.

Conclusions and Recommendations

1. Contaminated soil was encountered during grading and construction of associated improvements at Nursery Supplies, Inc. Contaminated soils were removed from the area under grading and stockpiled in the southwest part of the site (Area 5). Following removal of the contaminated soils, samples were collected from the bottom of the excavations and tested for styrene and ethyl benzene. The test results were none detected.

2. The stockpiled soils were spread and aerated in Area 5 following approval for this procedure from the AQMD. After aeration the aerated soil as well as the underlying native soil were tested for styrene and ethyl benzene. Test results were none detected. Based on these results, contamination has fully volatilized from the soil.

3. No other areas of contaminated soil were encountered during site improvements.

4. The contaminated soil in the Area of T-1 and T-2 was fully removed beneath the new roadway. Due to construction logistics removal did not extend east of the roadway during grading. The contaminated soil next to these two areas should be removed and replaced with clean material.

We trust this provides you with the necessary information. If you have any questions, please contact us at you convenience.

Respectfully submitted,

LEIGHTON AND ASSOCIATES, INC.

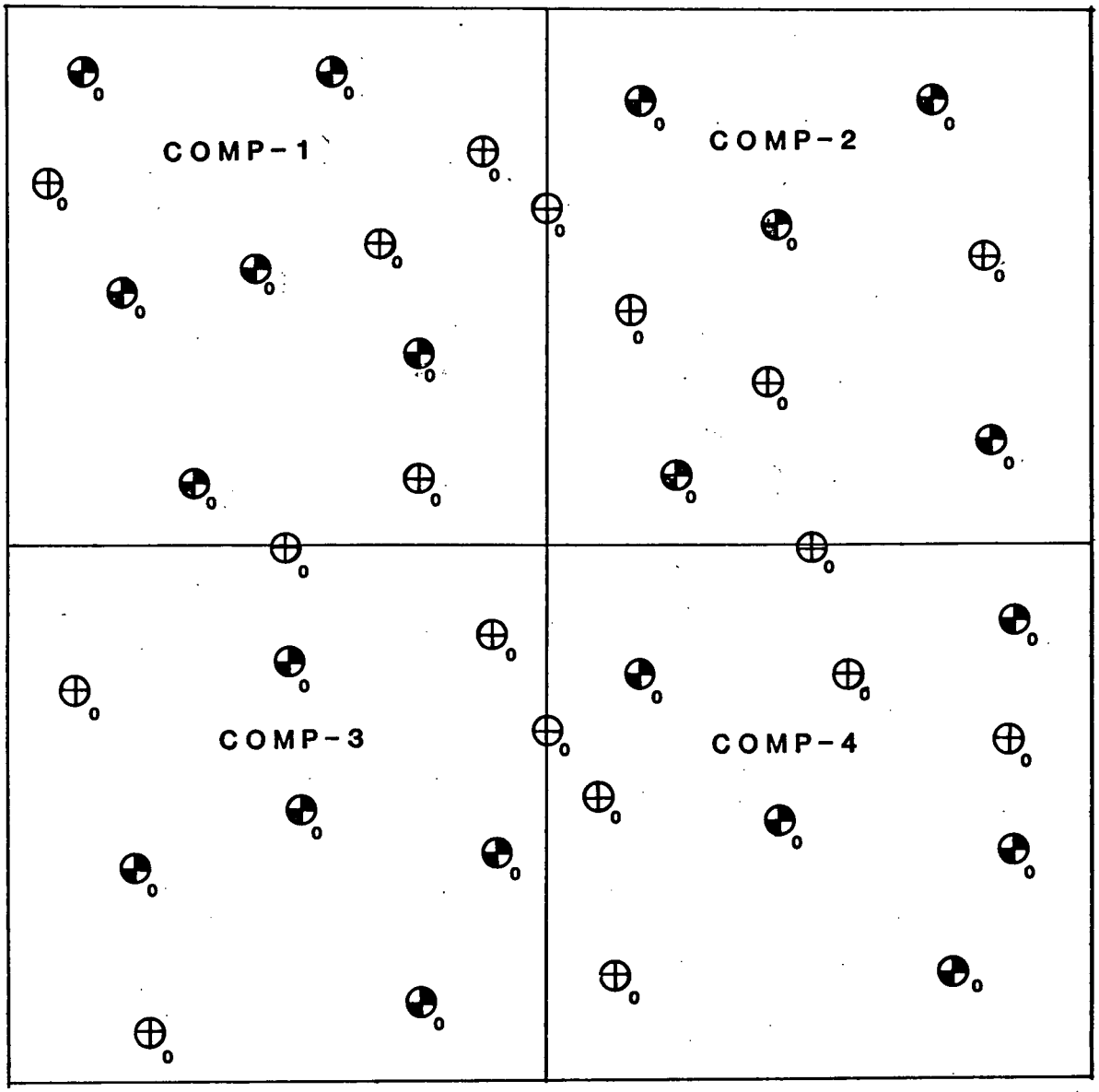
John H. Hansen, CEG 1082
Chief Engineering Geologist

Thomas E. Mills
Manager, Hazardous Materials Division

RDR/JHH/TM/rsm

Distribution: (2) Addressee

(2) Health Care Agency, County of Orange
Attention: Mr. John J. Hills



LEGEND

- ◕₀ NATURAL SOIL COMPOSITE SAMPLE LOCATION AND AERATING SOIL COMPOSITE SAMPLE LOCATION WITH PID MEASUREMENT.
- ⊕₀ AERATING SOIL COMPOSITE SAMPLE LOCATION WITH PID MEASUREMENT.

PLATE 2

SAMPLE LOCATION
FOR AERATED SOIL

Proj: 2840974-03	Scale: NONE	Date: 7/1/86
Engineer/Geologist: JHH/TM	Drafting By: RDR	

LEIGHTON and ASSOCIATES, INC.

APPENDIX A

LEIGHTON and ASSOCIATES
INCORPORATED

ASSOCIATED LABORATORIES
806 North Batavia - Orange, California 92668 - 714/771-6900

RECEIVED
SEP 24 1985
LEIGHTON & ASSOC INC

CLIENT

Leigton & Associates
1151 Duryea Avenue
Irvine, Ca. 92714

LAB NO. F10338

REPORTED 9/20/85

SAMPLE Soil

RECEIVED 9/19/85

IDENTIFICATION NS S-1-8' 9/19

BASED ON SAMPLE As Submitted

Ethyl Benzene	ND <0.1 ppm
Styrene	ND <0.1 ppm

ASSOCIATED LABORATORIES

Edward S. Behare, Ph.D.

ESB/rg

ASSOCIATED LABORATORIES
806 North Batavia - Orange, California 92668 - 714/771-6900

RECEIVED
SEP 24 1985
LEIGHTON & ASSOC INC

CLIENT

Leighton & Associates
1151 Duryea Avenue
Irvine, Ca. 92714

LAB NO. F10356

REPORTED 9/23/85

SAMPLE Soil

RECEIVED 9/20/85

IDENTIFICATION Nursery Supplies S-2 @ 4'

BASED ON SAMPLE As Submitted

Styrene Monomer	ND <0.1 ppm
Ethyl Benzene	ND <0.1 ppm

ASSOCIATED LABORATORIES

Edward S. Behare, Ph.D.

ESB/jg

ASSOCIATED LABORATORIES
806 North Batavia - Orange, California 92668 - 714/771-6900

CLIENT

Leighton & Associates
667 Brea Canyon Rd-Suite 31
Walnut, Ca. 91789
Attn: Bob Reynolds

LAB NO. F10459

REPORTED 9/26/85

SAMPLE Soil

IDENTIFICATION NSL 9/24

BASED ON SAMPLE As Submitted

RECEIVED 9/24/85

	STYRENE	ETHYL BENZENE
Comp-1, Trench Stock Pile	29 ppm	12 ppm
Comp-2, Stock Piles 1,2,3	ND <0.2 ppm	ND <0.1 ppm

ASSOCIATED LABORATORIES

Edward S. Behare, Ph.D.

ESB/rg

RECEIVED
SEP 30 1985
LEIGHTON & ASSOCIATES

RDR

ASSOCIATED LABORATORIES
806 North Batavia - Orange, California 92668 - 714/771-6900

CLIENT

Leighton & Associated
667 Brea Canyon Rd-Suite 31
Walnut, Ca. 91789
Attn: Bob Reynolds

LAB NO. F10746

REPORTED 10/4/85

SAMPLE Soil

RECEIVED 10/2/85

IDENTIFICATION Nursery Supplies T-5 Comp. 1 @ 3'
Project #280974-05

BASED ON SAMPLE As Submitted

Styrene	ND <0.1 ppm
Ethyl Benzene	ND <0.1 ppm

ASSOCIATED LABORATORIES

Henry M. Espoy

HME/rg

RECEIVED
OCT - 7 1985
LEIGHTON & ASSOCIATES

TESTING & CONSULTING
Chemical •
Microbiological •
Environmental •

ASSOCIATED LABORATORIES
806 North Batavia - Orange, California 92668 - 714/771-6900

CLIENT

Leighton & Associates
1151 Duryea Avenue
Irvine, Ca. 92714

LAB NO. F10780

REPORTED 10/4/85

SAMPLE Soil

RECEIVED 10/2/85

IDENTIFICATION Nursery Supplies F6 T6 Comp @ 1-3'
Project #2840974-05

BASED ON SAMPLE As Submitted

Styrene	ND <0.1 ppm
Ethyl Benzene	ND <0.1 ppm

ASSOCIATED LABORATORIES

Henry M. Espoy

HME/rg

RECEIVED
OCT 07 1985
LEIGHTON & ASSOC INC
IRVINE

ASSOCIATED LABORATORIES
806 North Batavia - Orange, California 92668 - 714/771-6900

CLIENT

Leighton & Associates
667 Brea Canyon Road
Suite 31
Walnut, Ca. 91789
Attn: Bob Reynolds

LAB NO. F12332

REPORTED 11/22/85

SAMPLE Soil

IDENTIFICATION As Shown Below

BASED ON SAMPLE As Submitted

RECEIVED 11/18/85

	STYRENE	ETHYL BENZENE
Comp-1 1/15	ND<0.2ppm	ND<0.1ppm
Comp-2 11/18	ND<0.2ppm	ND<0.1ppm
Comp-3 11/18	ND<0.2ppm	ND<0.1ppm
Comp-4 11/18	ND<0.2ppm	ND<0.1ppm
Comp-1,2A 11/18	ND<0.2ppm	ND<0.1ppm
Comp-3,4B 11/18	ND<0.2ppm	ND<0.1ppm

ASSOCIATED LABORATORIES

Edward S. Behare Ph.D.

ESB/la

RECEIVED
NOV 25 1985
LEIGHTON & ASSOCIATES

TESTING & CONSULTING
Chemical •
Microbiological •
Environmental •

South Coast
AIR QUALITY MANAGEMENT DISTRICT
9150 FLAIR DRIVE, EL MONTE, CA 91731 (818) 572-6200

October 4, 1985

Mr. John H. Hansen, Chief Engineering Geologist
Leighton and Associates Inc.
667 Brea Canyon Road Suite 31
Walnut, California 91789

Dear Mr. Hansen:

Reference is made to your letter of October 2, 1985 and our meeting on October 2, 1985 regarding the excavated contaminated soil at Nursery Supplies, 534 West Struck Avenue, Orange, California. Based on the information you have provided, it is my understanding that approximately 450 cubic yards of contaminated soil have been stockpiled on the property due to the grading operation and the owner wants to land farm the material on site to reduce the contamination level. In addition, the contamination is due to styrene monomer and ethyl benzene and current average concentrations vary between 1 to 150 ppm for the six stockpiles.

While the District would prefer that the organic contamination not be evaporated into the air, the proposed land farming operation does not require a permit from the District. If Nursery Supplies decides to proceed with the evaporation operation, care should be taken to ensure that a violation of Rule 402 (Nuisance) or Rule 403 (Fugitive Dust) does not occur. A copy of both rules is enclosed for your information. In addition, the District would appreciate being notified when the operation commences and ceases.

If you have any questions, please call the undersigned at (818) 572-6176.

Very truly yours,

Sanford M. Weiss
Director of Engineering

Fred E. Lettice
Supervising A. Q. Engineer

FEL

Enclosures

APPENDIX B

LEIGHTON and ASSOCIATES
INCORPORATED

501-A - (3/77)

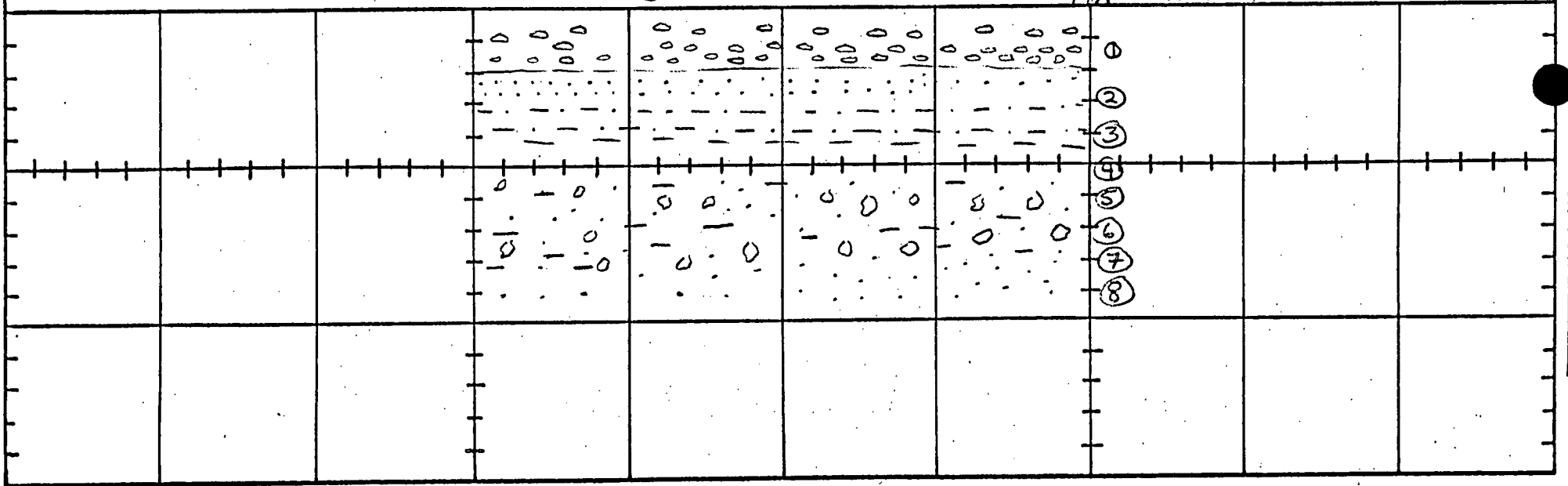
Project Name: Nursery Supplies
Project Number: 2840977405
Equipment: Back hoe

Logged By: ROR
Elevation: 193 ft
Location: East Wall

TRENCH NO. T-1

GEOLOGIC ATTITUDES PID	DATE: 9-19-85 DESCRIPTION:	GEOLOGIC UNIT	ENGINEERING PROPERTIES U.S.C.S.	Sample No.	P.I.D.	Density (pcf)
	0-2 Railroad Ballast			1 @ 1'	300	
	2-3 Fine to coarse sand			2 @ 2½'	30	
	3-4.5 Red Clay			3 @ 3'	10	
	4.5-8 Gravelly, Clayey fine to coarse sand with some cobbles.			4 @ 4'	10	
				5 @ 5'	6	
				6 @ 6'	1	
				7 @ 7'	0	
				8 @ 8'	0	

GRAPHIC REPRESENTATION SCALE: 1" = 5' SURFACE SLOPE: Flat TREND: N-S



LOG OF TRENCH NO: T-1

Leighton & Associates

501-A - (3/77)

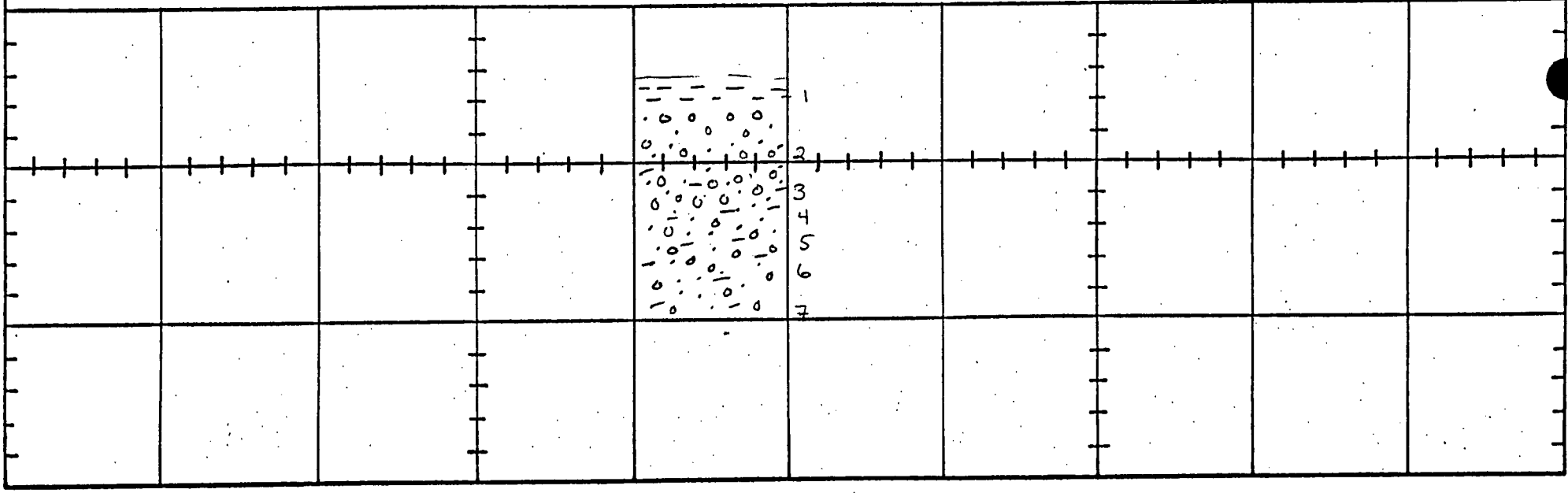
Project Name: Nursery Supplies
Project Number: 2940974-05
Equipment: Backhoe

Logged By: ROR
Elevation: 183 ft.
Location: South Wall

TRENCH NO. T-1

GEOLOGIC ATTITUDES	DATE: 9-19-85 DESCRIPTION:	GEOLOGIC UNIT	ENGINEERING PROPERTIES U.S.C.S.	Sample No.	P.I.D.	Density (pcf)
	0-1' Red Clay 1-8' Gravelly, Clayey Fine to coarse Sand with some cobbles, Moist, Reddish Brown			1@1' 2@3' 3@4' 4@5' 5@6 6@7' 7@8'	5 5 2 0 0 0	

GRAPHIC REPRESENTATION SCALE: 1" = 5' SURFACE SLOPE: Flat TREND: N-S



LOG OF TRENCH NO: T-1

Leighton & Associates

501-A - (3/77)

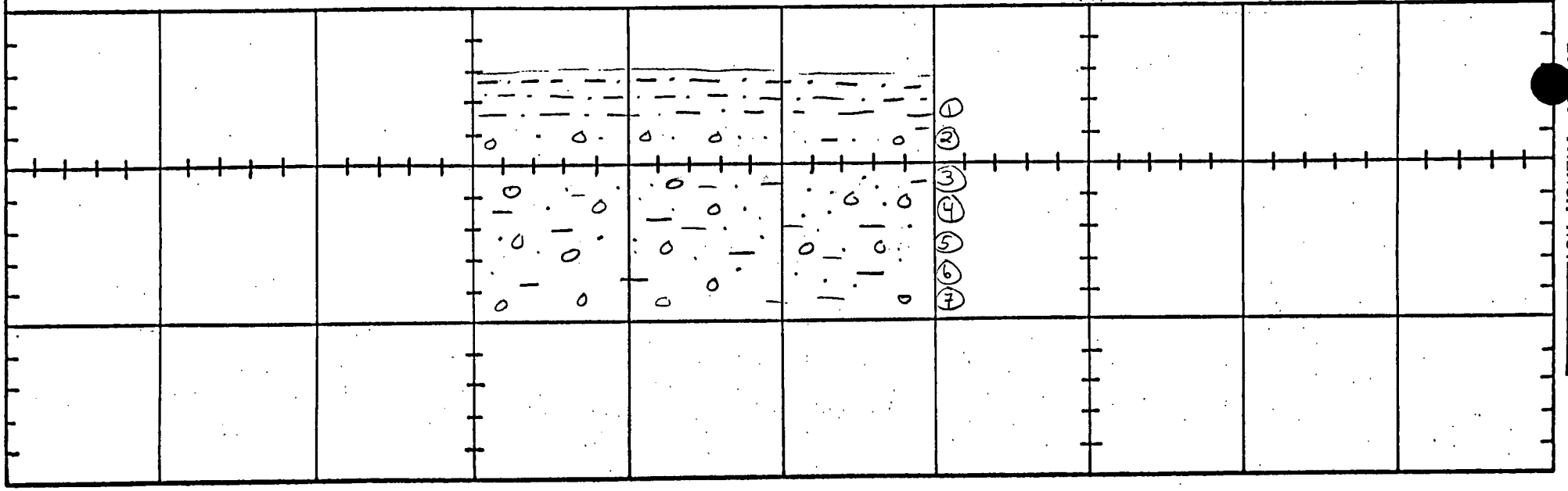
Project Name: Nursery Supplies
Project Number: 2840974-05
Equipment: Back Hoe

Logged By: RDR
Elevation: 183 ft.
Location: West Wall

TRENCH NO. T-1

GEOLOGIC ATTITUDES	DATE: 9-19-85 DESCRIPTION:	GEOLOGIC UNIT	ENGINEERING PROPERTIES U.S.C.S.	Sample No.	P.I.D.	Density (pcf)
	0 - 1½' Red Clay 1½' - 8' Gravelly, Clayey Fine to coarse sand with some cobbles, Moist, Reddish Brown.			1@1' 2@2' 3@3' 4@4' 5@5' 6@6' 7@7'	5 5 5 - - 0 0	

GRAPHIC REPRESENTATION SCALE: 1" = 5' SURFACE SLOPE: Flat TREND: N-S



LOG OF TRENCH NO: T-1

Leighton & Associates

501-A - (3/77)

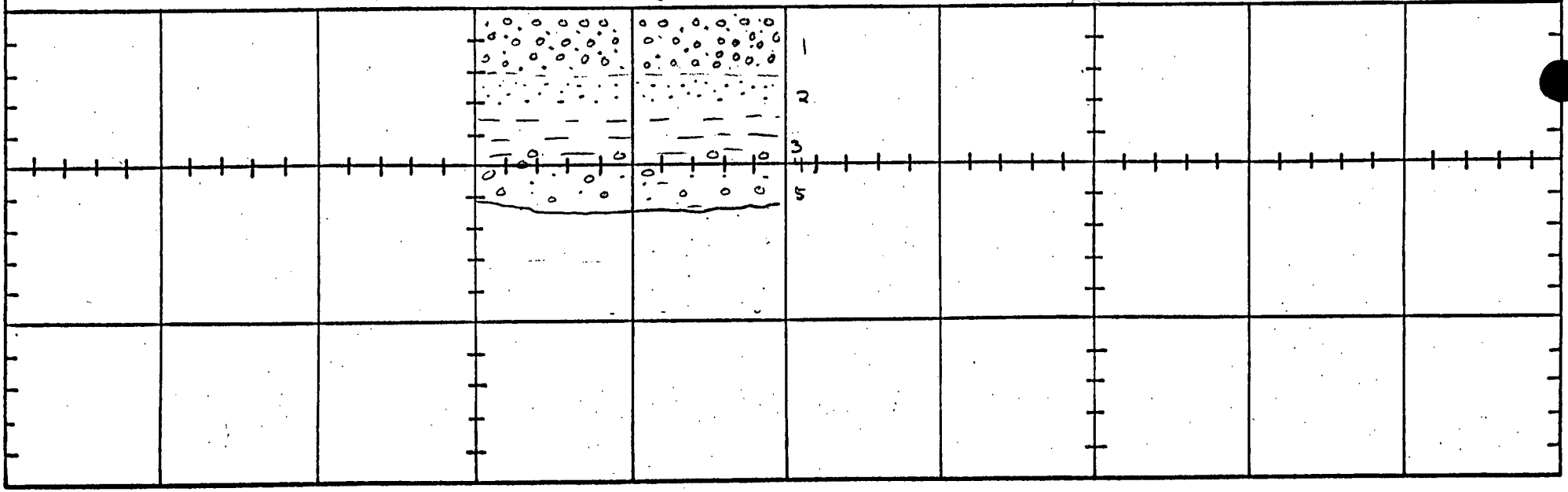
Project Name: Nursery Supplies
Project Number: 2840974-05
Equipment: Back Hoe

Logged By: RDR
Elevation: 183 ft.
Location: East Wall

TRENCH NO. T-2

GEOLOGIC ATTITUDES	DATE: 9-19-85 DESCRIPTION:	GEOLOGIC UNIT	ENGINEERING PROPERTIES U.S.C.S.	Sample No.	P.I.D.	Density (pcf)
	0-2 Railroad Ballast			1 @ 1'	60	
	2-3 Fine to coarse sand, damp, Gray-Yellow			2 @ 2½'	25	
	3-4½ Red Clay			3 @ 4'	8	
	4½-6 Gravelly, Fine to coarse Sand, with Some Cobbles, Moist, Reddish Brown.			4 @ 5'	1	
				5 @ 6'	0	

GRAPHIC REPRESENTATION SCALE: 1" = 5' SURFACE SLOPE: Flat TREND: NS



LOG OF TRENCH NO: T-2

Leighton & Associates

501-A - (3/77)

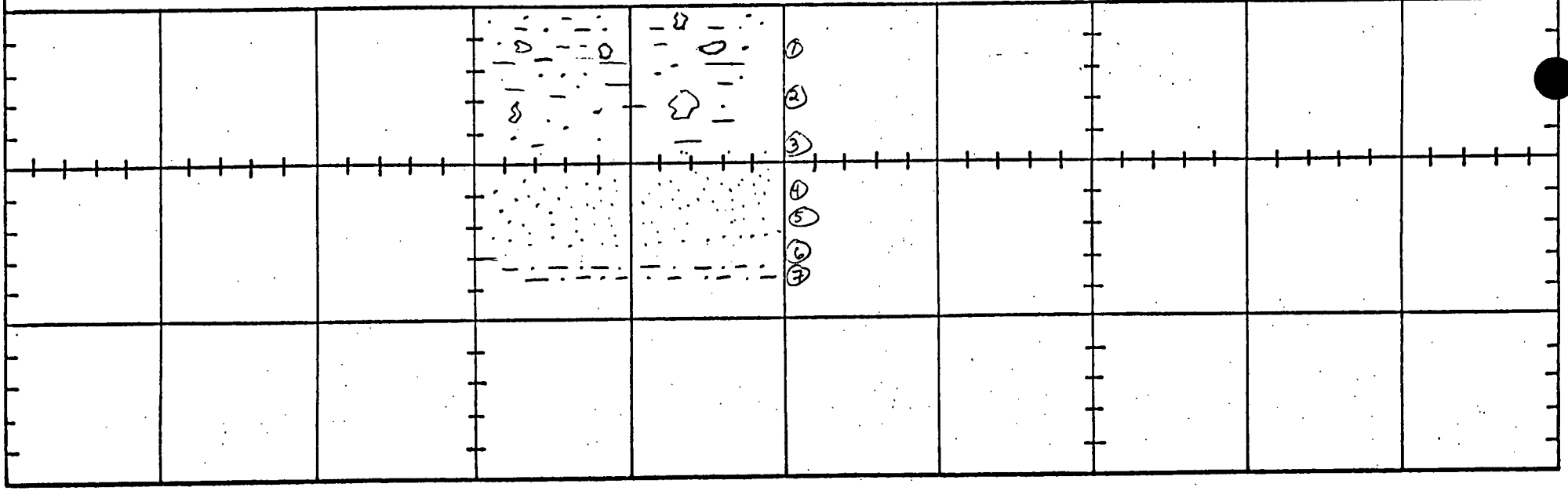
Project Name: Nursery Supplies
Project Number: 2850974-05
Equipment: Backhoe

Logged By: RDR
Elevation: ≈ 180'
Location: See Map

TRENCH NO. T-3

GEOLOGIC ATTITUDES	DATE:	DESCRIPTION:	GEOLOGIC UNIT	ENGINEERING PROPERTIES: U.S.C.S.	Sample No.	Moisture (%)	Density (pcf)
		0-10' Fill material, Dark to olive green, damp, clayey sand, with gravel, concrete debris, wood debris, pipes.			1@3'	0	
					2@6	0	
					3@9	0	
					4@12	0	
					5@15	0	
		10-16' Tan, moist, silty V. fine to coarse sand,			6@17	0	
					7@185	0	
		16'-18.5' Reddish Brown, moist, silty clay. roots.					

GRAPHIC REPRESENTATION SCALE: 1" = 10' SURFACE SLOPE: Flat TREND: N-S



LOG OF TRENCH NO: _____

Leighton & Associates

501-A - (3/77)

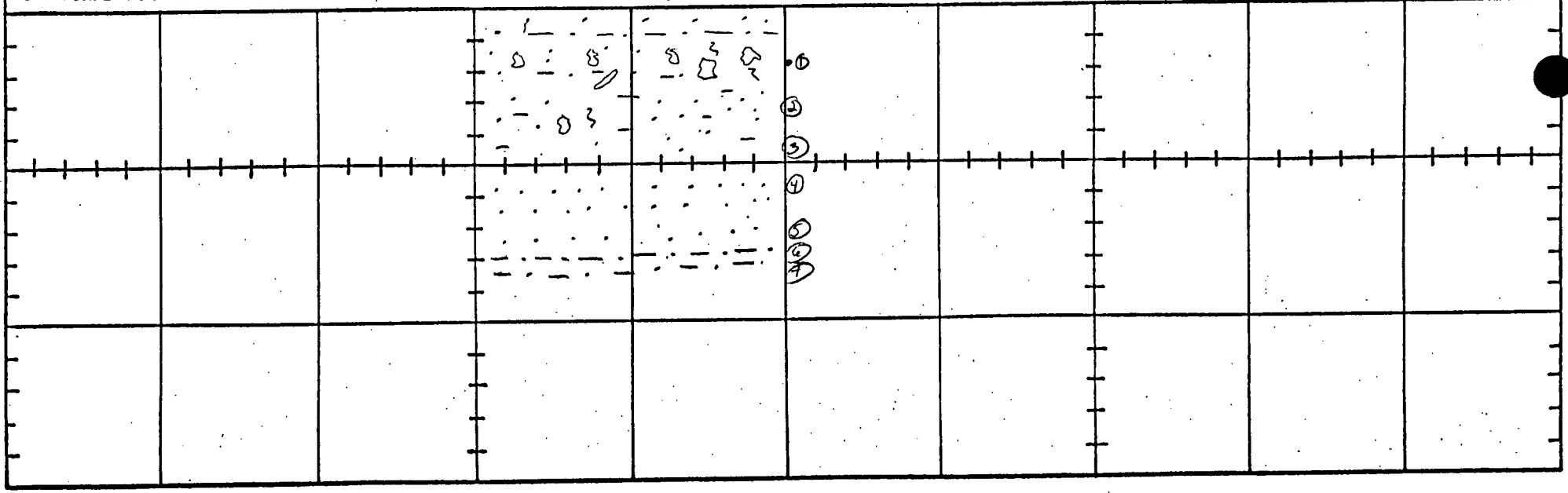
Project Name: Nursery Supplies
Project Number: 2850974-05
Equipment:

Logged By: RDR
Elevation: ≈180
Location: See Map

TRENCH NO. T-4

GEOLOGIC ATTITUDES	DATE:	DESCRIPTION:	GEOLOGIC UNIT	ENGINEERING PROPERTIES U.S.C.S.	Sample No.	Moisture (%)	Density (pcf)
		0-10' Fill material, Dark to olive Green, damp, clayey sand with gravel, concrete debris, wood debris, pipes.			1@2.5'	0	
					2@6'	0	
					3@9'	0	
					4@12'	0	
					5@15'	0	
		10-16' Tan, moist, silty V. fine to coarse sand.			6@16'	0	
					7@17'	0	
		16-17.5' Reddish brown, damp, siltyclay. roots					

GRAPHIC REPRESENTATION SCALE: 1" = 10' SURFACE SLOPE: Flat TREND: N40°W



LOG OF TRENCH NO: _____

Leighton & Associates